

### Remarks

The substitute specification has been amended to add section headings, an abstract, and antecedent basis for claimed subject matter by incorporation of language from the claims into the specification and by referring to drawing numbers in the newly provided drawings incorporating structure from the original specification and claims. The objections to the specification should therefore be withdrawn.

Figure 1 is essentially identical to original Figure 1 except that entry of materials into the center of the mixer, i.e. at the hollow shaft, as described at the top of page 5 of the specification and to show an access door 17, e.g. as set forth in claim 39 and a container rotating motor 22 as shown in the original drawing.

A new Figure 2 is provided consistent with the original specification and claims. The new drawing (along with original Figure 1) shows mixing container 15 (originally shown but not numbered in Figure 1), mixing agitator 18 including mixing agitator drive 23 (originally shown but not numbered in Figure 1), vacuum seal 16 (originally shown but not numbered in Figure 1), means for feeding components (original feed line 2 and sources 2 and 3), means for supplying hot water or hot water vapor (the line from vapor supply 12 and water line 8), and means for removing mixed components (door 17). In addition, new Figure 2 shows agitator 18 with entry lines 2, 8 and 12) and apertures 19. Further, entries through the top wall for entry of hot water vapor or water are shown that function whether or not the mixing container rotates, as previously discussed. Figure 2 also shows conduits to a wall scraper 20 and a baffle 21.

No new matter is added as all structure is described in the original specification, claims and/or shown in the original drawing.

The Examiner has objected to the drawings on the ground that the subject matter of claims 39-45 is not shown in the original drawings. Many of the items were in fact shown in the original drawing, although some were not numbered. The drawings, as amended illustrate all structure claimed in claims 39-45 and since the structure in the drawings was either shown in the original drawing or specifically described in the original specification and claims, no new matter is added.

The drawings have also been corrected to meet the requirements for uniform and well defined lines, numbers and letters and to correct numbering of views.

The Examiner has rejected claims 39, 40, 41 and 42 under 35 U.S.C. 102(b) as being anticipated by Palm (U.S. 5,284,085). This rejection should be withdrawn. Original claim 39 clearly indicates in the preamble that the apparatus is "for conditioning moulding sand". Such a statement clearly indicates that the apparatus is suitable for that purpose and thus would be sized and powered to accomplish that goal. For purposes of clarification, claim 39 has been amended to include a mixing agitator drive (shown in the original drawing) and indicating that the agitator and drive are suitable for mixing moulding sand as clearly described in the specification, e.g. as on page 6, lines 20-22 of the original specification. This is simply not the case with the Palm apparatus that is clearly designed for mixing particulate (and liquid) materials such as foods. Even the densest of foods are less than one-third as dense as sand, thus a mixer designed for mixing foods would not have anywhere near the powers or strengths required to mix sand. No

mixer, anywhere near having such stringent requirements, is disclosed or suggested by Palm. Further Palm suggests no reason whatsoever for at least tripling design requirements in the Palm mixer and until the present application no such reason in fact existed. Palm is therefore applied by impermissible hindsight where the Palm mixer does not have sufficient design strength or power to mix sand and no reason is suggested for creating such a design. Further, the presently claimed apparatus claims require that the mixer rotate. This is clearly not the case with palm which would require a back and forth motion in sand (if there were a suggestion for use in sand) which would require an unsuitable level of power (also not suggested by Palm). Even further it would be impossible for holes in the agitator to face away from the direction of rotation since the palm device does not rotate but goes back and forth which would result in plugged holes no matter which direction they faced. It is thus clear that even as applied, Palm simply does not disclose or suggest the present invention. The rejection is improper and should be withdrawn. Claims 40, 41, and 42 are dependent from claim 39 and contain the limits of claim 39. Claims 40, 41 and 42 are therefore patentable over Palm for the same reasons that claim 39 is patentable over Palm.

Claims 39, 43 and 44 have been rejected under 35 U.S.C. 102 (b) as being anticipated by Graham (U.S. Patent 3,521,863). This rejection is improper and should be withdrawn.

At the outset it should be pointed out that Graham does not disclose or suggest a rotating mixing agitator and certainly does not disclose or suggest such an agitator having a drive, as required by the rejected claims. At the best, Graham has a scraper bar that is not driven at all and could not in any normal sense be considered an agitator. Further, as in Palm, the application of

the apparatus is entirely different and less stringent design requirements are need. Graham discloses agitation of resins that are always less than a third the density of sand. Graham discloses or suggests nothing and no reason why his design should be “beefed up” by 300% as would be required if foundry sand were to be mixed. Graham clearly does not suggest holes in an agitator facing away from its direction of rotation. This is again an impermissible hindsight rejection that does not disclose or suggest the present invention.

Claims 39, 43 and 45 have been rejected under 35 U.S.C. 102 (b) as being anticipated by Peacock (U.S. Patent 5,603,567). This rejection is improper and should be withdrawn.

At the outset Peacock simply does not disclose or suggest an agitator of any kind and certainly does not disclose or suggest an agitator with a drive as claimed. The “vanes” referred to by the Examiner are fixed to the side walls of the drum and do not move independently of the drum as is the case with an agitator. The “vanes”, if anything are more akin to baffles which no person skilled in the art would consider to be an agitator. Further, as in Palm, the application of the apparatus is entirely different and less stringent design requirements are need. Peacock discloses agitation of food products that are always less than a third the density of sand. Peacock discloses or suggests nothing and no reason why his design should be “beefed up” by 300% as would be required if foundry sand were to be mixed. There is no suggestion at all of holes in an agitator facing away from its direction of rotation. This is again an impermissible hindsight rejection that does not disclose or suggest the present invention.

Claims 39, 43 and 45 have been rejected under 35 U.S.C. 102 (b) as being anticipated by Mack (U.S. Patent 2,628,080). This rejection is improper and should be withdrawn.

At the outset Mack simply does not disclose or suggest an agitator of any kind and certainly does not disclose or suggest an agitator with a drive as claimed.

The application intended by Mack is not given but in view of the state of the art at the time of Mack, it appears that the blending operation would hardly have been intended to be steam or water into moulding sand. Such an application would not have been contemplated in conjunction with a mixing agitator, as required by the present claims, and the rotating drum of Mack would not have been met the increased design requirements needed by such an application. Mack suggests no rotating agitator, no holes in the agitator for provision of steam or water, and no holes facing in a direction opposite its direction of rotation. This is again an impermissible hindsight rejection that does not disclose or suggest the present invention.

Claims 39, 40, 41 and 42 have been rejected under 35 U.S.C. 102 (b) as being anticipated by McIlvaine (U.S. Patent 2,593,327). This rejection is improper and should be withdrawn.

For a rejection under 35 U.S.C. 102, all structure claimed must be described in the cited reference. McIlvaine simply does not meet this requirement. In particular, means for providing hot water or hot water vapor is not provided. (It should be noted that McIlvaine is a cooling chamber.), nor can McIlvaine stop inlet flows to create a sufficient vacuum for cooling and vapor evaporation. The use of the word "vacuum" by McIlvaine is probably inappropriate since that term is not commonly used for minor pressure drops, e.g. as in McIlvaine where inlet and outlets are wide open. In such a case no significant vacuum can be developed since even if the inlet is smaller, as more air is removed, velocity at the inlet will increase. Note that even a pinhole in a vacuum line will prevent any reasonable vacuum from forming. This applies even to

maintenance of low pressure reductions such as those encountered in normal pumping operations where no lift can be obtained if even a pin hole in the inlet line is present. McIlvaine clearly does not disclose or suggest the present invention. McIlvaine suggests nothing concerning holes in an agitator facing in a direction opposite its direction of rotation. The rejection should be withdrawn.

Claims 23, 25, 26, 31, 39 and 43 have been rejected under 35 U.S.C. 102 (b) as being anticipated by Suginaka et al. (U.S. Patent 5,816,312). The rejection is improper and should be withdrawn.

Suginaka et al. does not disclose or suggest the invention as currently claimed. With respect to the method of the invention, it should be noted that a major feature is that used moulding sand can be better reconditioned if it is first cooled and then reheated with addition of moisture and then re-cooled under vacuum. Prior to the present invention, it was simply not known or recognized that reheating cooled moulding sand followed by vacuum cooling would result in a superior reconditioned moulding sand product. Suginaka et al. simply does not disclose or suggest reheating cooled used moulding sand as required by the present method claims followed by vacuum treatment to remove moisture (that may be added) to cool and condition the sand. Suginaka et al. does not even recognize a way to re-use old moulding sand without purifying the sand to remove binding materials. Note that Suginaka et al. adds binder to salvaged sand indicating that binding materials were previously removed.

With respect to the apparatus claims, Suginaka et al. clearly does not disclose or suggest holes in an agitator facing away from its direction of rotation for providing water or water vapor

and does not suggest a vacuum means capable of providing a cooling vacuum and certainly not below the vapor pressure of water. Clearly, none of the method of the invention, the improved product nor the apparatus for practicing the invention are disclosed or suggested by Suginaka et al. nor by any of the other cited references or their combination.

Claims 23, 25, 26, 31, and 39 have been rejected under 35 U.S.C. 102 (b) as being anticipated by Kruse. This rejection should also be withdrawn.

Kruse simply does not disclose or suggest reheating cooled used moulding sand as required by the present method claims followed by vacuum treatment to remove moisture (that may be added) to cool and condition the sand. Kruse does not even recognize a way to re-use old cooled moulding sand. Kruse does not reheat cooled sand as required by the present method claims.

Kruse clearly does not disclose or suggest providing moisture to the sand through holes in an agitator and certainly not through such holes facing away from the direction of rotation of the agitator. Clearly, none of the method of the invention, the improved product nor the apparatus for practicing the invention are disclosed or suggested by Kruse. nor by any of the other cited references or their combination.

Claims 23, 25, 26, 31, and 39 have been rejected under 35 U.S.C. 102 (b) as being anticipated by GB 2066683. This rejection should also be withdrawn.

GB 2066683 simply does not disclose or suggest reheating cooled used moulding sand as required by the present method claims followed by vacuum treatment to remove moisture (that may be added) to cool and condition the sand. GB 2066683 does not even recognize a way to re-

use old cooled moulding sand. GB 2066683 does not reheat cooled sand as required by the present method claims.

GB 2066683 clearly does not disclose or suggest providing moisture to the sand through holes in an agitator and certainly not through such holes facing away from the direction of rotation of the agitator. Clearly, none of the method of the invention, the improved product nor the apparatus for practicing the invention are disclosed or suggested by GB 2066683 nor by any of the other cited references or their combination.

Claims 23, 25, 26, 27, 29, 30, 31, 33, 34 and 38 have been rejected under 35 U.S.C. 102 (b) as being anticipated by Christiansen et al. This rejection should also be withdrawn.

Christiansen et al. clearly removes bonding materials from the sand and is not at all directed to recovery of moulding sand without using these exhaustive steps. The exhaustion of fines hardly qualifies as providing a vacuum or providing a vacuum means. Certainly such a device is open to permit air flow carrying fines. The pressure differential is minimal and would have minimal effect upon cooling by water vaporization. There is certainly no suggestion of a vacuum below the vapor pressure of water or of any means or method for obtaining it. There is also no disclosure or suggestion of an agitator provided with holes for provision of water or water vapor.

Claims 23, 25, 26, 27, 29, 30, 31, 32, 33, 34, 37, 39, 40, 43, 44, and 45 have been rejected under 35 U.S.C. 102 (b) as being anticipated by Brunner et al. (U.S. Patent 3,690,622) This rejection should also be withdrawn.

This reference suggests nothing whatsoever concerning conditioning pre-used cooled moulding sand. It certainly does not suggest reheating moulding sand followed by vacuum treatment to cool it and remove moisture. It further suggests nothing whatsoever concerning an agitator having holes for provision of water or water vapor. A "device for sucking out dry material" hardly qualifies as a vacuum producing means and certainly does not provide a vacuum below the vapor pressure of water.

Claims 23, 24, 25, 26, 27, 31, 39 and 43 have been rejected under 35 U.S.C. 102 (b) as being anticipated by Leidel et al. This rejection should also be withdrawn.

Leidel clearly removes bonding materials from the sand and is not at all directed to recovery of moulding sand without using these exhaustive steps. The exhaustion of air hardly qualifies as providing a vacuum or providing a vacuum means. Certainly such a device is open to permit air flow. The pressure differential is minimal and would have minimal effect upon cooling by water vaporization. There is certainly no suggestion of a vacuum below the vapor pressure of water or of any means or method for obtaining it. There is also no disclosure or suggestion of an agitator provided with holes for provision of water or water vapor. The rejection should be withdrawn.

Claims 28, 30, 33, 34, and 35 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Leidel (4,709,862) in view of Campbell. The rejection should be withdrawn.

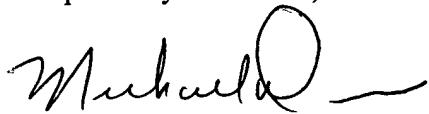
Leidel is an inappropriate reference for reasons previously discussed. Campbell does not cure the critical defects of Leidel. In particular, Campbell relates to a blending machine for making particle board and is in no way related to reconditioning used moulding sand. It is thus



Conclusion

Applicant respectfully submits that all pending claims are now in condition for allowance, which action is courteously requested.

Respectfully submitted,



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